

MS#183302.1 (MSFT 4966)
PATENT**Amendments to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A computer-implemented method for extracting at least one funnel from ~~at least one input clickstream (CS) data for analyzing user interactions with one or more web sites~~, said CS data representing an ordered path of web pages P_1 to P_N ~~at the one or more web sites~~ successively viewed by a user, said computer-implemented method comprising:

storing each ordered path within the CS data in one of up to N tree structures, each of said tree structures having a root node P_i corresponding to one of pages P_1 to P_N and having successive child nodes corresponding to the successive pages after P_i of P_{i+1} to P_{i+X} , said X representing a depth criterion; and

extracting a list of stored paths from each ~~of the tree structure~~ structures from the root node P_i to each end node to represent a set of funnels corresponding to the CS data.

Claim 2 (currently amended): The computer-implemented method of claim 1, wherein storing comprises incrementing a counter associated with each node in each ordered path as the ordered path is stored, and further comprising analyzing each stored path in each tree structure using the counters to identify the stored paths that satisfy one or more selected input criteria.

Claim 3 (currently amended): The computer-implemented method of claim 2, wherein the input criteria is selected from a group consisting of a width criterion for the child nodes, a starting page criterion, and an end page criterion, said width criterion representing a retention rate, said starting page criterion specifying a set of pages in CS data from which P_i is selected, and said end page criterion specifying a set of pages in CS data that can serve as end nodes in each ~~of the tree structures~~ structure.

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Claim 4 (currently amended): The computer-implemented method of claim 3, wherein the retention rate is a function of ~~measured by~~ a frequency relative to ~~either~~ one of the following: the root node or the previous child node.

Claim 5 (currently amended): The computer-implemented method of claim 3, wherein the retention rate is a function of ~~measured by~~ an absolute frequency.

Claim 6 (currently amended): The computer-implemented method of claim 3, wherein the width criterion specifies one or more of the following: a minimum width and ~~[[or]]~~ a maximum width ~~or both~~.

Claim 7 (currently amended): The computer-implemented method of claim 1, wherein the depth criterion specifies a maximum depth.

Claim 8 (currently amended): The computer-implemented method of claim 1, wherein the depth criterion represents a desired number of pages in each stored path.

Claim 9 (currently amended): The computer-implemented method of claim 1, wherein P_i corresponds to one of P_1 to P_N specified as starting page criterion.

Claim 10 (currently amended): The computer-implemented method of claim 1, wherein the stored path is a subpath.

Claim 11 (currently amended): The computer-implemented method of claim 1, wherein storing comprises scanning the CS data one time.

Claim 12 (currently amended): The computer-implemented method of claim 1, further comprising automatically generating a report of the extracted list of stored paths.

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Claim 13 (currently amended): The computer-implemented method of claim 1, wherein ~~[[One]]~~ one or more computer-readable media have ~~having~~ computer-executable instructions for performing the computer-implemented method recited in claim 1.

Claim 14 (currently amended): A computer-implemented method for analysis of funnels in at ~~least one input~~ clickstream (CS) data for analyzing user interactions with one or more web sites, said CS data representing at least one ordered path of web pages at the one or more web sites accessed by a user, said computer-implemented method comprising:

storing, in one or more tree structures, one or more paths within the CS data that satisfy ~~satisfying~~ a first input criterion ~~in one or more tree structures;~~ and

analyzing each of the tree structure structures to identify any of the paths that satisfy a second input criterion, said second input criterion representing a width criterion.

Claim 15 (currently amended): The computer-implemented method of claim 14, wherein the first input criterion comprises one or more of the following: a depth criterion specifying a maximum number of pages in each stored path and ~~[[or]]~~ a starting page criterion specifying a set of pages in the CS data that can serve as a root node in one of the tree structures ~~or both.~~

Claim 16 (currently amended): The computer-implemented method of claim 14, wherein the stored path is a subpath.

Claim 17 (currently amended): The computer-implemented method of claim 14, wherein storing comprises:

creating a tree structure for each starting page of the one or more paths; and

creating one or more branches in each of the tree structure structures for each path that starts with one of the starting pages.

Claim 18 (currently amended): The computer-implemented method of claim 14, wherein ~~[[One]]~~ one or more computer-readable media have ~~having~~ computer-executable instructions for performing the computer-implemented method recited in claim 14.

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Claim 19 (currently amended): A computer-implemented method for extracting at least one funnel from one or more input clickstreams for analyzing user interactions with one or more web sites, each of said clickstreams comprising data representing an ordered path of web pages at the one or more web sites successively viewed by a user, said computer-implemented method comprising:

creating a tree structure for storing the ordered path for each of the clickstreams, each tree structure having a root node corresponding to the first page of the clickstream and having a child node corresponding to each of the successive pages in the clickstream;

for each input starting page, searching each tree structure to identify any stored path that starts at a node associated with the input starting page and satisfies an input depth requirement, said input depth requirement representing a desired number of pages in each path;

storing each identified path in a temporary tree; and

recurring through the temporary tree to identify any path that satisfies an input width requirement, said input width requirement representing a retention rate.

Claim 20 (currently amended): The computer-implemented method of claim 19, wherein the identified path is a subpath.

Claim 21 (currently amended): The computer-implemented method of claim 19, wherein the recursed path is a subpath.

Claim 22 (currently amended): The computer-implemented method of claim 19, wherein storing comprises incrementing a counter associated with each node in each path as the path is stored.

Claim 23 (currently amended): The computer-implemented method of claim 19, wherein ~~[[One]]~~ one or more computer-readable media have ~~having~~ computer-executable instructions for performing the computer-implemented method recited in claim 19.

Claim 24 (currently amended): A computer-readable medium having computer-executable components for extracting at least one funnel from ~~at least one input~~ clickstream (CS) data

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representing an ordered path of successively viewed pages P_1 to P_N of a user for analyzing user interactions with a web site, said components comprising:

a repository component for storing each ordered path within the CS data in one or more tree structures ~~[[of]]~~ up to N tree structures, each of said tree structures having a root node P_i corresponding to one of pages P_1 to P_N and having successive child nodes corresponding to the successive pages after P_i of P_{i+1} to P_{i+X} , said X representing a depth criterion;

a support component for incrementing a counter associated with each node in each ordered path as the ordered path is stored;

a funnel component for extracting a list of stored paths from each of the tree structure structures from the root node P_i to each end node to represent a set of funnels corresponding to the CS data; and

a criteria component for analyzing each stored path in each of the tree structure structures using the counters to identify the stored paths that satisfy one or more input criteria.

Claim 25 (currently amended): The computer-readable medium method of claim 24, wherein the input criteria is selected from a group consisting of a width criterion, a starting page criterion, and an end page criterion, said width criterion represents a retention rate, said starting page criterion specifies a set of pages in CS data from which P_i is selected, and said end page criterion specifies a set of pages in CS data that can serve as end nodes in each of the tree structure structures.

Claim 26 (currently amended): A computer-readable medium having stored thereon a data structure for a particular node in a tree structure storing at least one click path from one or more input clickstreams representing an ordered path of successively viewed web pages P_1 to P_N of a user for analyzing user interactions with a web site, said tree structure having a root node, each particular node associated with one of the viewed web pages, said data structure comprising:

a first field including data storing a page name identifying a page name for the viewed web page associated with the particular node; and

a second field storing a support value representing a frequency of appearance for a particular path including the viewed web page identified in the first field, said particular path starting with the root node of the tree structure and including the particular node.

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Claim 27 (original): The computer-readable medium of claim 26, wherein the data structure is created for each distinct web page in the input clickstreams as the clickstream is scanned.

Claim 28 (currently amended): A computer-implemented method for extracting at least one funnel from ~~at least one input~~ clickstream (CS) data representing an ordered path of successively viewed pages P_1 to P_N at one or more web sites for analyzing user interactions with the one or more web sites, said computer-implemented method comprising:

- reading through CS data from P_1 to P_X , wherein X is less than or equal to N and represents an input depth;
- creating a first tree with a root node associated with page P_1 , and with successive child nodes associated with pages P_2 to P_X , wherein P_X represents a child node with parent P_{X-1} ;
- incrementing a counter associated with each node in the first tree as the node is created;
- creating a second tree with a root node associated with page P_2 , and with successive child nodes associated with pages P_3 to P_{X+1} ;
- incrementing a counter associated with each node in the second tree as the node is created;
- creating additional trees rooted at each page P_{N-X+2} to P_N for all subpaths in CS data starting with pages P_{N-X+2} to P_N ;
- storing the subpaths that start at each page and ending at P_N in the respective tree so that new trees are created only when the trees or nodes have not already been created; and
- running through all paths in each tree to extract and output only paths that satisfy input depth and input width criteria.

Claim 29 (original): The method of claim 28, further comprising processing another clickstream according to the method described in claim 28.

Claim 30 (original): The method of claim 28, wherein the tree for a page P_i is only created if P_i is part of an input starting page criterion.

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Claim 31 (currently amended): The computer-implemented method of claim 28, wherein One
one or more computer readable media have having computer-executable instructions for
performing the computer-implemented method recited in claim 28.